

IN THE CLAIMS

Please amend the claims as follows. All pending claims after this amendment are
5 listed below for the convenience of the Examiner. Claims amended by the Amendment
are indicated as such.

21. A semiconductor via structure being defined through an inter-metal
dielectric, comprising:

a first conductive pattern element; and

a layer of SOG material formed over the first conductive pattern element, the
layer of SOG material having a via hole defined therethrough, such that the via hole
defines a path to the first conductive pattern element,

wherein the via hole has a via wall surface, the via wall surface is defined along
the SOG material that extends to the first conductive pattern element, and the via wall
surface has a hydrophobic material layer.

22. A semiconductor via structure being defined through an inter-metal
dielectric as recited in claim 21, wherein the hydrophobic material layer is a reaction
20 product of silicon dioxide and a halogen compound.

23. A semiconductor via structure being defined through an inter-metal
dielectric as recited in claim 22, wherein the halogen compound is NH_4F .

24. A semiconductor via structure being defined through an inter-metal
dielectric as recited in claim 22, wherein the halogen compound is CCl_4 .

25. A semiconductor via structure being defined through an inter-metal dielectric as recited in claim 23, further comprising:

a layer coating the via hole in direct substantially continuous contact with the hydrophobic material layer, the layer coating being a titanium nitride material.

26. A semiconductor via structure being defined through an inter-metal dielectric as recited in claim 25, further comprising:

10 a conductive fill material contained within the via hole and in direct substantially continuous contact with the layer coating.

27. A semiconductor via structure being defined through an inter-metal dielectric as recited in claim 26, further comprising:

15 a second conductive pattern element in conductive contact with the conductive fill material, the titanium nitride material, and the first conductive pattern element, thereby defining a reliable conductive interconnection between a first metal layer network that includes the first conductive pattern element and a second metal layer network that includes the second conductive pattern element.

20 Please add the following new claims:

28. (New) A semiconductor via structure, comprising:

a first conductive pattern element; and

25 a layer of spin-on-glass material formed over the first conductive pattern element, the layer of spin-on-glass material having a via hole defined therethrough,

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contd

such that the via hole defines a path to the first conductive pattern element, wherein the via hole has a via wall surface, the via wall surface is defined along the spin-on-glass material that extends to the first conductive pattern element, and the via wall surface has a hydrophobic material layer that is a reaction product of silicon dioxide and a halogen compound.

29. (New) A semiconductor via structure as recited in claim 28, wherein the halogen compound is NH_4F .

10 30. (New) A semiconductor via structure as recited in claim 28, wherein the halogen compound is CCl_4 .

31. (New) A semiconductor via structure as recited in claim 29, further comprising:

15 a layer coating the via hole in direct substantially continuous contact with the hydrophobic material layer, the layer coating being a titanium nitride material.

32. (New) A semiconductor via structure as recited in claim 31, further comprising:

20 a conductive fill material contained within the via hole and in direct substantially continuous contact with the layer coating.

33. (New) A semiconductor via structure, comprising:

a substrate; and

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could
5 a layer of spin-on-glass material formed over the substrate, the layer of spin-on-glass material having a via hole defined therethrough, such that the via hole defines a path to the substrate, wherein the via hole has a via wall surface, the via wall surface is defined along the spin-on-glass material that extends to the substrate, and the via wall surface has a hydrophobic material layer that is a reaction product of silicon dioxide and a halogen compound, the halogen compound being selected from one of NH_4F and CCl_4 ; and

10 a layer coating the via hole in direct substantially continuous contact with the hydrophobic material layer.

34. (New) A semiconductor via structure as recited in claim 33, wherein the layer coating is a titanium nitride material.

35. (New) A semiconductor via structure as recited in claim 34, further
15 comprising:

a conductive fill material contained within the via hole and in direct substantially continuous contact with the layer coating.